

Remarks

The above amendments and these remarks are responsive to the Office action dated June 14, 2005. Claims 22-27 are pending in the application. Applicants thank the Examiner for careful consideration of the subject application.

Information Disclosure Statement

First, regarding the information disclosure statement and U.S. 4,779,528, Applicants submit herewith an updated statement with the correct patent number, which is U.S. 4,779,582.

Introduction

Before discussion the prior art, Applicants believe it may be helpful to briefly review some background information. As described in Applicants' specification, various engine operations may be carried out under different conditions. For example, under some conditions, all of the engine cylinders may carry out combustion (with all or some of the valves in each cylinder activated), yet under other conditions, less than all of the engine cylinders may carry out combustion (again where the cylinders carrying out combustion can have different active or deactivated valve configurations). In still other conditions, the number of engine strokes in a combustion cycle may also be varied, if desired. In this way, it is possible to meet differing engine torque demands, emissions constraints, electrical conditions, etc.

However, the inventors have also recognized that if a valve degrades, at least some of these different engine operations may be affected. As such, in one embodiment (claim 22), a method for selecting valve actuating modes in a multi-valve engine having at least an electromechanically actuated valve is provided. The method comprises:

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determining an operating condition of said electromechanically actuated valve;

operating the engine in at least a first and second cylinder configuration when said operating condition indicates acceptable performance of said electromechanical valve, said first configuration including engine operation where at least said valve operates and said second configuration including engine operation where at least said valve is deactivated; and

restricting operation in said first configuration and operating the engine at least in said second configuration when said operating condition indicates a condition of degraded performance of said electromechanical valve.

In this way, it is possible provide different engine operating modes to improve engine or vehicle operation, yet still provide appropriate engine operation in response to valve degradation.

Di Lieto et al. (U.S. 6,390,038)

The Office action applies Di Lieto et al. to claims 22, 23, and 24, and states at page 2:

Claims 22, 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Di Lieto et al. Di Lieto et al discloses disabling an electromechanically actuated valve, column 5, lines 40-49, when degraded performance is indicated by current flow and temperature. Since the valve is rendered inoperative, all cylinder modes are deactivated.

Applicants respectfully submit that assuming this is true, Di Lieto et al. fails to show the features of amended claim 22. For example, Applicants can find no description of operating the engine in at least a first and second cylinder configuration when said operating condition indicates acceptable performance of said electromechanical valve. Rather, Di Lieto et al. only describes excluding a cylinder when a valve is not functioning correctly. As such, Applicants respectfully request the rejection based on Di Lieto et al. be withdrawn.

Hirasawa et al. (U.S. 6,178,934)

The Office action applies Hirasawa et al. to claims 22 and 26 and states at page 2:

Claims 22 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirasawa et al (6,178,934). In column 4, lines 21-39, Hirasawa et al discloses disabling an electromagnetically operated engine valve when its position is indicated as abnormal. Since the valve is rendered inoperative, all cylinder modes are deactivated.

Again, Applicants respectfully submit that assuming this is true, Di Lieto et al. fails to show the features of amended claim 22. Again, Applicants can find no description of operating the engine in at least a first and second cylinder configuration when said operating condition indicates acceptable performance of said electromechanical valve. Like Di Lieto et al., Hirasawa et al. only describes stopping a cylinder upon detecting a malfunction of a variable valve timing mechanism. As such, Applicants respectfully request the rejection based on Hirasawa et al. be withdrawn.

Fritz (U.S. 4,990,854)

The Office action applies Fritz in combination with Di Lieto et al. However, Fritz fails to solve the deficiency of Di Lieto et al. Further, Applicants object to the combination since Fritz relates to valves "in injection systems and anti-lock systems of brakes," rather than engine cylinder valves.

Kirsch et al. (U.S. 3,828,247)

The Office action applies Kirsch et al. in combination with Di Lieto et al. However, Kirsch et al. fails to solve the deficiency of Di Lieto et al. Further, Applicants object to the

combination since Kirsch et al. relates to "testing a fuel injection valve," rather than engine cylinder valves.

Conclusion

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is courteously requested to contact the undersigned by fax or telephone at the number listed below.

Further, Applicants have added several new claims, and request that these be examined.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being sent via facsimile to the U.S. Patent and Trademark Office at (571) 273-8300 on September 14, 2005.

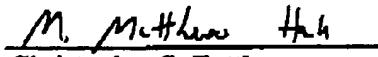


Lauren Barberena

Respectfully submitted,

ALLEMAN HALL MCCOY RUSSELL & TUTTLE, LLP

2. # 43,653


Christopher S. Tuttle
Registration No. 41,357
Customer No. 36865
of Attorneys for Applicant
806 SW Broadway, Suite 600
Portland, Oregon 97205
Telephone: (503) 459-4141
Facsimile: (503) 459-4142